

## **New Eastern Palaearctic Myrmecophile *Lepidopria* and *Tetramopria* (Hymenoptera, Proctotrupoidea, Diapriidae, Diapriini)**

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**Abstract** In the present study, three species (*Lepidopria masneri* sp. n., *Tetramopria tortilis* sp. n. and *Tetramopria turbinata* sp. n.) are described as new to science.

**Key words** Systematics, Hymenoptera, Proctotrupoidea, Diapriidae, Diapriini.

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### **INTRODUCTION**

The status of the tribe Diapriini is examined and Lepidopriini is confirmed as a synonym. Within Diapriini, the genera *Lepidopria* and *Tetramopria* are gregarious endoparasitoids of the puparia of tachinid flies and include one and two western European species respectively. Recent research on material from Korea and Japan has resulted in the recognition of the following species new to science: *Lepidopria masneri* sp. n., *Tetramopria tortilis* sp. n. and *Tetramopria turbinata* sp. n. This represents a considerable extension to the known range of both genera and will be of particular interest to students of ethology, since both genera have been recorded previously as symphiles of myrmicine ants. The following repository abbreviations are used: CNCI, the Canadian National Collection of Insects, Ottawa, Canada; DGN, the author's collection.

### **SYSTEMATICS**

**DIAPRIINI Haliday, 1833**  
**= Lepidopriini Kozlov, 1971: 23**

Recently there has been an attempt to divide the Diapriini by Kozlov (1971) who separated the tribe Lepidopriini from the rest of the Diapriini. Kozlov included *Platymischus* together with *Cyathopria*, *Lepidopria* and *Solenopsia* in the Lepidopriini because they all have modified petioles and because he considered them all to be apterous (except for *Cyathopria*). It is considered here that this grouping is somewhat artificial. Firstly, only *Platymischus* is apterous, the other genera are primarily alate but frequently become dealated (Ferrière, 1927; Wing, 1951). Kozlov was probably misled by the key in Kieffer (1916) which states that all except *Cyathopria* are apterous or have reduced wings. Secondly, these genera do all have modified petioles but a knowledge of their biology suggests that this is a parallel adaptation: in the case of *Platymischus* it is probably an adaptation to protect

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the petiolar joints from wetting and or fouling by rotten seaweed in the wrack beds where it lives; for the other genera, which are myrmecophiles (*Lepidopria* and *Solenopsis*) (Wing, 1951) or presumed myrmecophiles (*Cyathopria*) (Ferrière, 1927), the modification provides a degree of morphological mimicry of the host ants (Wing, 1951). Thus these four genera have no common features which set them apart from the rest of the Diapriini and are retained in the Diapriini here. This view supports Huggert & Masner (1983) who retained the three myrmecophile genera within the tribe Diapriini.

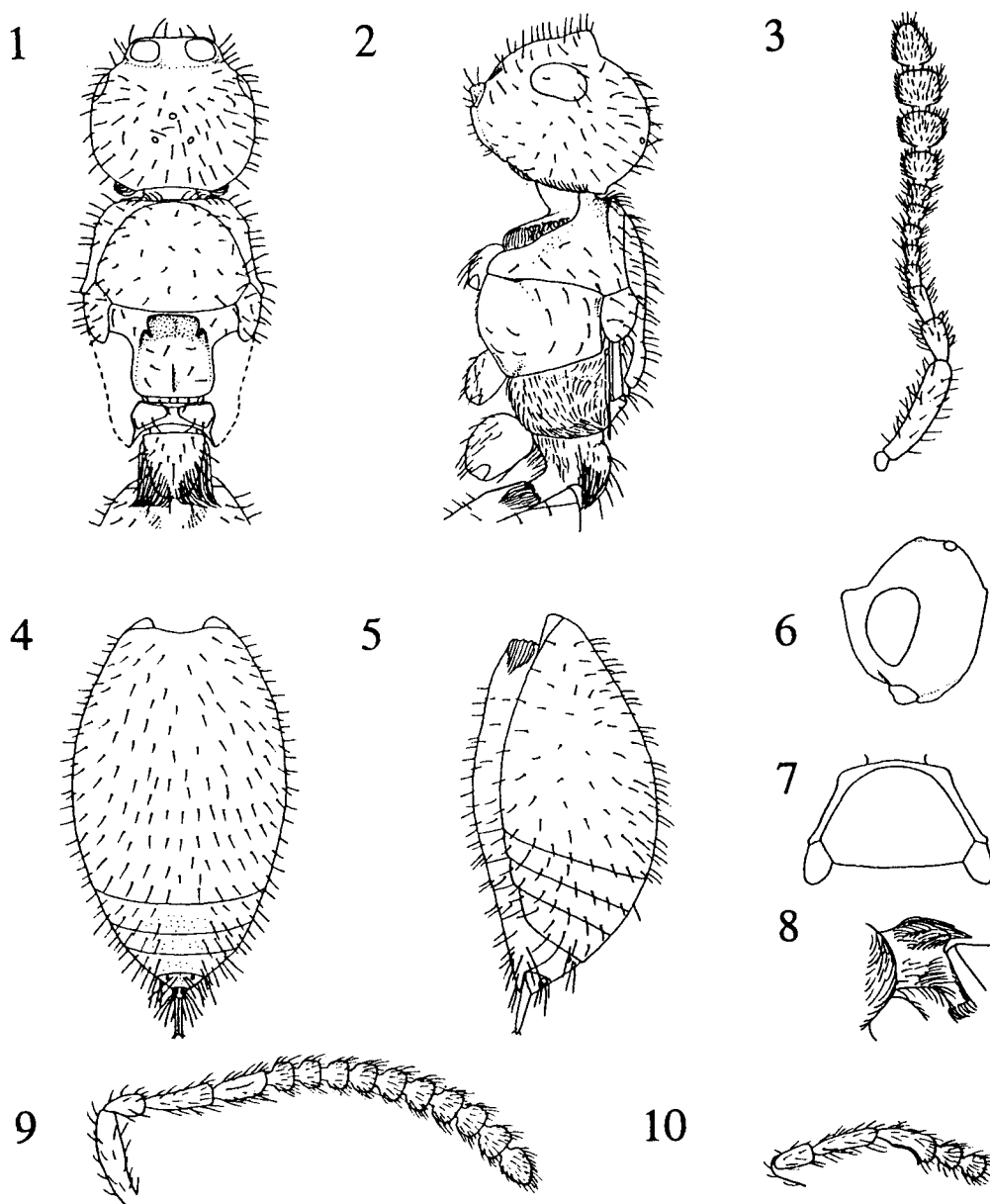
### ***Lepidopria* Kieffer, 1910**

*Lepidopria* includes only one undoubted species, *Lepidopria pedestris* Kieffer, 1911, recorded from Europe and reared from the puparium of a tachinid fly which was found in an adult scarabaeid beetle (Huggert & Masner, 1983) and symphilic in the nests of the ant *Solenopsis fugax* (Latreille) (Ferrière, 1927; Hölldobler, 1928; Wing, 1951). According to Masner & Muesebeck (1968) and Huggert & Masner (1983) the North American *Lepidopria aberrans* Brues, 1916 is only doubtfully placed in this genus. *Lepidopria* species show a number of features correlated with myrmecophile habits in diapriids such as: reduced eye size; reduced pigmentation, especially the female antenna which has the club yellow; unusual setation; enlargement of the petiole and lastly, dealation.

#### ***Lepidopria masneri* sp. n. (Figs 1-10)**

**Female.** Head rounded, smooth, slightly wider than long seen from above (fig. 1), higher than long (1:0.9) seen from the side (fig. 2), with characteristic, short, erect setae; occiput with only a little woolly pubescence near margin; ocelli small, inconspicuous, arranged in an almost equilateral triangle, of which the base is slightly longer than the other two sides; compound eye small with only 30-40 facets; malar space large, slightly smaller than length of eye; tentorial pit elongate; mouth opening small, about 0.5 of the width of the head, with small, triangular, apically bidentate mandibles. Antenna (fig. 3) 12-jointed, with short, semidecumbent to erect pubescence; scape stout, somewhat flattened and curved, about 4.5 times as long as greatest width; pedicel cylindrical, 1.5-1.8 times as long as wide; a3 much narrower than the pedicel, 1.8 times as long as wide; a4 and a5 about as wide as a3 and slightly longer than wide; a6-8 becoming slightly wider and a little transverse; a9-12 forming an abruptly expanded 4-jointed club, pubescence slightly shorter than on rest of antenna; a9-a11 somewhat rounded; a9 transverse; a10 slightly transverse; a11 as long as wide and a12 ovoid, 1.3-1.4 times as long as wide.

**Mesosoma.** (figs 1 & 2) about as wide as head; pronotum anteriorly with a weak collar of woolly pubescence, anterior corners with a strongly produced carina or epomia (Nixon, 1957: 4; Richards, 1977: 13), laterally with short, erect setae; propleuron with woolly pubescence on ventral 0.3; mesoscutum weakly convex, without notaulices, but with short, erect setae which are not arranged in a regular pattern; scutellum with a transverse, weakly reniform pit, 2.0 times as wide as long, with a small fovea at each side; scutellar disc with a very weak medial carina sometimes only weakly raised posteriorly and with short, erect setae; mesopleuron with short, erect setae; propodeum short dorsally, dorsal areas transverse, somewhat oblique, smooth, shiny and without pubescence, well defined laterally and with a broad medial keel which is hardly raised anteriorly, but widened posteriorly where it merges into the posterior propodeal margin; metapleuron and propodeum laterally with short, adpressed, slightly woolly pubescence. Legs moderately robust, hind femur 2.4 times as long as greatest width; as well as the more usual setation, the legs have short, erect setae similar to those of body; fore tibia with apical spine slender, its length 0.6 of the apical width of the tibia. The wings of all three females had been broken off near their bases so that the stumps did not



**Figs. 1-10.** *Lepidopria masneri* sp. n. 1-5, ♀: 1, head, mesosoma and petiole, dorsal view; 2, head, mesosoma and petiole, lateral view; 3, antenna, lateral view; 4, gaster, dorsal view; 5, gaster, lateral view; 6-10, ♂: 6, head, lateral view, setae omitted; 7, anterior mesosoma, dorsal view, setae omitted; 8, petiole, lateral view; 9, antenna, lateral view; 10, antenna, pedicel to sixth joint, dorsal view. Scale bar 0.2 mm.

exceed the end of the mesosoma.

**Metasoma.** Petiole (figs 1 & 2) short, produced postero-dorsally into a stout lobe which extends backwards a short distance over the large tergite, dorsally with short, erect pubescence, laterally with short, adpressed pubescence, apically with longer pubescence in two tufts at posterior corners;

gaster (figs 4 & 5) about as long as head and mesosoma combined, slender, more than twice as long as its greatest width, dorso-ventrally compressed; large tergite taking up basal 0.7 of gaster, dorsally with short, erect, evenly distributed setae, basally emarginate and medio-basally weakly concave to flat where it opposes the petiolar lobe, in one of the three females with weak, irregular radiating striae around basal area (fig. 4); tergites 3 to 6 with fine puncturation medially; large sternite basally with short but strong, medial carina, basal corners extending forwards either side of petiole beyond base of large tergite; ovipositor shortly exerted.

Colour of body brown to yellowish brown, head somewhat darker and tegulae somewhat yellower than the rest; antenna yellow to brownish yellow, scape darkened apically, club joints yellow; legs brownish-yellow, femoral clubs slightly darker.

*Length.* 1.5-1.8 mm (holotype 1.5 mm).

*Male.* As for female but differing as follows: Head (fig. 6) less rounded; eye relatively larger, with malar space about 0.5 of width of the eye; ocelli larger. Antenna (fig. 9) 14-jointed, all joints with semidecumbent pubescence, shorter than width of joints; scape as for female, pedicel cylindrical, 1.5 times as long as wide; a3 flattened, 2.8 times as long as greatest width; a4 flattened, 2.5 times as long as greatest width, somewhat expanded apically, inner surface with curved carina (fig. 10); flagellar joints a5-13 short; a5-6 about as long as wide to slightly transverse; a7-13 becoming slightly larger and more transverse; apical joint ovoid, 1.4-1.6 times as long as wide. Mesosoma somewhat wider than head; pronotal carina shorter and less pronounced although still obvious (fig. 7); mesoscutum convex; scutellar pit more rectangular and slightly longer, 1.8 times as wide as long. Legs more slender, hind femur 2.9 times as long as greatest width. Wings entire, fully developed, extending well past apex of gaster, subcostalis slightly sinuate, wing membrane with a small patch bare of setae at apex of marginalis.

*Metasoma.* Petiole (fig. 8) with dorsal lobe less strongly developed and only extending a little past the basal margin of the large tergite; gaster relatively broader, 1.6 times as long as greatest width; in the Japanese specimen, which had not collapsed, the tergites extend laterally beyond the edge of the sternites, and are without setae medially.

Colour of body blackish brown, with head black and tegulae brown; antennae brown with pedicel and base of scape yellowish, legs yellowish brown with coxae, femoral and tibial clubs darkened.

*Length.* 1.3-1.5 mm.

*Material.* HOLOTYPE, ♀ Japan, Honshu, Ibaraki, Tsukuba, NIAES, 31.V-8. VI.1989, Pan Trap, M. Sharkey (CNCI). Paratypes (3♀): ♀, Japan, Honshu, Aichi Narai, Toyota, 15-22. VII.1990, Pan Trap, K. Yamagishi (CNCI); ♀, Japan, Honshu, Aichi Pref., Douzuki, Obara, 13-19. IX.1990, Pan Trap, K. Yamagishi (DGN); ♀, Japan, Kyushu, Fukuoka, 700 metres, Mt. Hiko, 4-11. IX.1989, Malaise Trap, K. Takeno & M. Sharkey (CNCI). Non-types (2♂): ♂, Japan, Kyushu, Fukuoka, 700 metres, Mt. Hiko, 18-25. VIII.1989, Malaise Trap, K. Takeno & M. Sharkey (CNCI); ♂, South Korea, Mt. Sudo, 128 00'E, 35 50'N, 400 metres, 22. VIII.1990, K. Yamagishi (DGN).

*Biology.* Host unknown. The similarity of *L. masneri* sp. n. to *L. pedestris* suggests myrmecophile habits although there is no evidence for the dealation of males as is the case for *L. pedestris* (Wing, 1951). *L. masneri* sp. n. shows pronounced sexual dimorphism, particularly with relation to eye size and colour, suggesting that the male is less adapted to myrmecophily and spends relatively more time outside of the host nest.

*Distribution.* Japan: Honshu, Kyushu and South Korea: Mount Sudo. This is the first undoubted species of *Lepidopria* to be recorded outside Europe and as such represents a considerable extension to the known range of the genus.

*Comments.* *L. masneri* sp. n. may be easily distinguished from *L. pedestris* in both sexes by

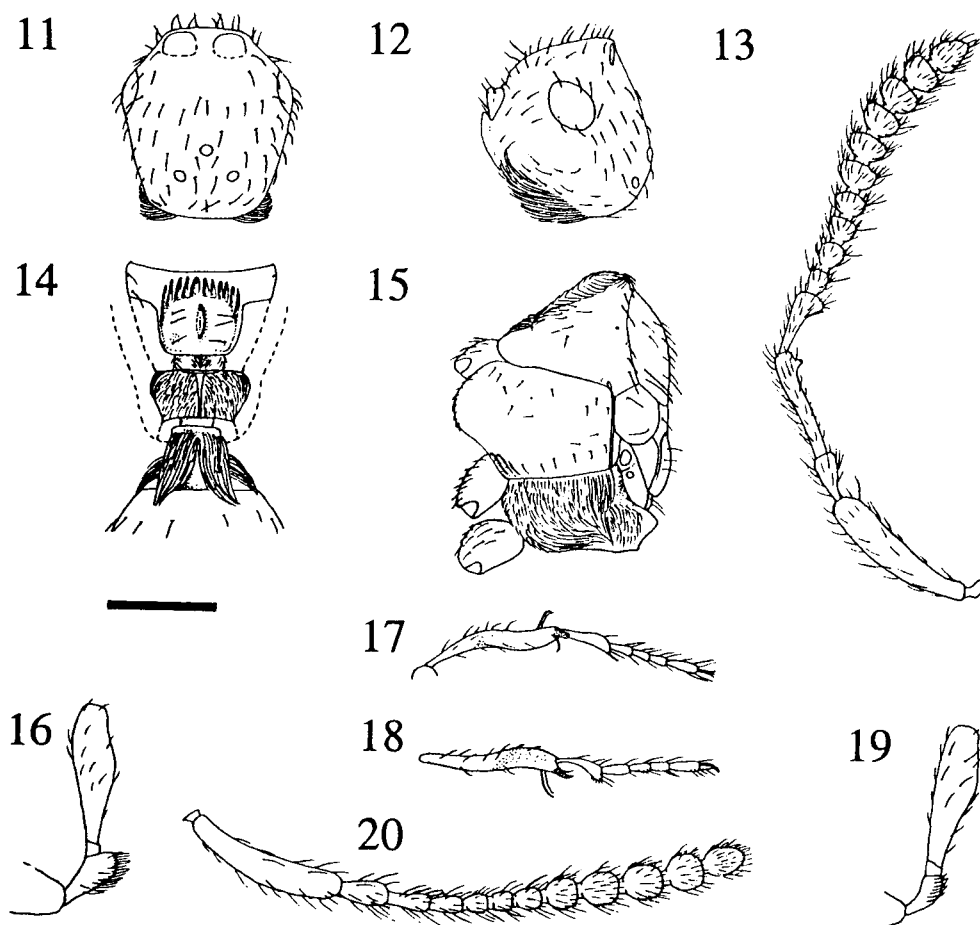
the strongly developed epomia (compare fig. 1 with Ferrière, 1927: fig. 1) and by the petiole which extends over the base of the gaster (compare fig. 1 with Huggert & Masner, 1983: fig. 6) and also in the male sex by the form of the antenna (compare figs 9 & 10 with Ferrière, 1927: fig. 2. and Pschorn-Walcher, 1957: fig. 2f). The first two characters serve to associate the sexes which are otherwise quite dimorphic. The form of the petiole is superficially similar to that of *Bruesopria* Wing, 1951 and may cause difficulty in keying this species in the generic key of Huggert & Masner (1983). *L. masneri* sp. n., however, clearly belongs to *Lepidopria* on the basis of the other characters given by Huggert & Masner, that is, the form of the propodeum and, for the female, the 12-jointed antenna with a 4-jointed club. This species is named after Dr. Lubomir Masner who kindly made available the material for this study.

### ***Tetramopria* Wasmann, 1899**

*Tetramopria* has been retained here as a full genus although Wall (1980) considered it a subgenus of *Trichopria*. It is abundantly distinct both morphologically and biologically. *Tetramopria* species show a number of features correlated with myrmecophile habits in diapiids including: reduced eye size; reduced pigmentation; additional setation and lastly, dealation by the host ants. These features are usually more pronounced in the female sex. A particular feature of the genus is the collar of hair on the pronotum which is dense, yellow and projecting, exposing the boss-like anterior corners of the pronotum. From the observations of Wasmann (1899:56-57) this structure has a function analogous to that of the trichomes of some myrmecophile Coleoptera. The biology of the genus is poorly known although, of the European species, *T. aurocincta* Wasmann has been reared from the puparia of tachinid flies parasitic on lepidopterans (Szelényi, 1957; Huggert & Masner, 1983) and both *T. aurocincta* and *T. cincticollis* Wasmann have been recorded as symphiles in the nests of the ant *Tetramorium caespitum* (Linnaeus) (Wasmann, 1899). *Tetramopria* includes two undoubted species, both of which have only been recorded from Western Europe. According to Dodd (1915) the Australian species are only doubtfully placed in this genus. The two new species described below represent a considerable extension to the known range of the genus to the Eastern Palaearctic. The currently recognised Palaearctic species can be divided into two clearly defined species groups, as outlined in the following key:

Key to Palaearctic *Tetramopria* (the female of *T. turbinata* is unknown)

1. Scutellar disc tectiform, with a sharp medial keel covering its entire length and extending forwards into basal pit; basal pit usually without costae, floor of pit smooth, rarely weakly striate to costate; basal margin of large tergite with two shallow foveae; female antennal club four-jointed; male with mid-trochanter and mid-tibia unmodified and with third antennal joint less elongate, about 2.5 times as long as greatest width (*aurocincta* group) ..... 2
- Scutellar disc flat to weakly raised, with at most a short, blunt keel; basal scutellar pit strongly costate from front to back; basal margin of large tergite without foveae; female antennal club five-jointed; male with mid-trochanter expanded, triangular, with mid-tibia strongly twisted and with third antennal joint more elongate, about 4.0 times as long as greatest width (*cincticollis* group) ..... 3
2. Scutellar disc not emarginate posteriorly; basal margin of large tergite slightly concave, without carinae, basal foveae smooth; dorsal propodeal areas less deeply foveate; frons less convex; antenna less robust; mesopleuron with more hairs in lower half (Europe) ... *aurocincta* Wasmann
- Scutellar disc broadly emarginate posteriorly; basal margin of large tergite undulate, with two



**Figs. 11-20.** *Tetramopria tortilis* sp. n. 11-18, ♂: 11, head, dorsal view; 12, head, lateral view; 13, antenna, dorsal view; 14, posterior mesosoma and petiole, dorsal view; 15, mesosoma, lateral view; 16, mid-femur and trochanter, anterior view; 17, mid-tibia and tarsus, antero-ventral view; 18, mid-tibia and tarsus, antero-dorsal view; 19-20, ♀: 19, mid-femur and trochanter, anterior view; 20, antenna, dorsal view. Scale bar 0.2 mm.

- oblique carinae, basal foveae striate; dorsal propodeal areas more deeply foveate; frons more convex; antenna more robust; mesopleuron with fewer hairs in lower half (Korea) ..... *turbinata* sp. n.
3. Third antennal joint without sub-apical tooth on inner side; scutellar disc flat and smooth; without pronounced ventral concavity in front of mid coxae (Europe) ..... *cincticollis* Wasmann (= *donisthorpei* Kieffer, = *femoralis* Kieffer)
- Third antennal joint with sub-apical tooth on inner side; scutellar disc domed, weakly tectiform and weakly striate or weakly rugose; with pronounced ventral concavity in front of mid coxae (Japan) ..... *tortilis* sp. n.

***Tetramopria tortilis* sp. n.** (Figs 11-20)

**Female.** Head with short, semidecumbent to adpressed setae, roughly hexagonal when seen from above, evenly tapered behind eyes and longer than wide (1:0.9), about as long as high, somewhat

angular when seen from the side with the frons long and only weakly convex; occiput with a dense, regularly arranged cushion of setae on either side; ocelli small, arranged in a roughly equilateral triangle, of which the base is slightly longer than the sides; compound eye small with 25-30 facets; malar space large, about 1.2 times the length of the eye; mouth opening slightly more than half the width of the head; mandibles triangular, apically bidentate, only overlapping a little. Antenna (fig. 20) 12-jointed, with semidecumbent setae on all joints, these a little longer than the width of a3; scape curved, expanded towards apex; pedicel about 1.9 times as long as wide; a3 much narrower, 2.6 times as long as wide; a4 elongate, 1.2 times as long as wide; a5-6 each about as long as wide; a7 slightly larger, quadrate; a8-12 widened, forming a loose 5-jointed club; a8-11 about as long as wide, somewhat rounded; a12 ovoid, about 1.3 times as long as wide.

*Mesosoma.* Barely as wide as head; pronotum with a narrow, dense, regular collar of pubescence, shoulder produced into a rounded boss not covered by collar; propleuron almost entirely smooth and shiny, with a small area of pubescence latero-ventrally; mesoscutum smooth, strongly convex anteriorly, with about 20, short, semidecumbent setae mostly arranged in two submedial tracts; scutellum with broad, costate, basal pit, crossed by 9-10 carinae; scutellar disc convex, weakly tectiform, weakly longitudinally striate posteriorly, with narrow lateral margins; mesopleuron smooth with scattered, adpressed setae, ventrally with a large concavity in front of the mid coxae, so that, when seen from the side, the lower margin of the mesopleuron appears sinuate; metapleuron and sides of the propodeum with short, adpressed setae; dorsal areas of the propodeum well defined, dull and with adpressed setae, medially with a strongly developed keel which is raised anteriorly to form a right-angled tooth. Legs moderately robust; hind femur 3.0 times as long as wide; apical spine of fore tibia slender, about 0.5 times the apical width of the fore tibia; mid-trochanter slightly thickened (fig. 19); mid-tibia with a small apical spine which is short, broad, flattened and only about as long as the apical width of the basitarsus; mid-basitarsus about 1.2 times as long as the tarsal end joint. Wings broken off near base, so that the stumps barely extend beyond the apex of the mesosoma.

*Metasoma.* Petiole short, slightly raised when seen from side, transverse when seen from above, covered in adpressed hairs which are longer towards the apex and drawn out into four tufts; gaster short and broad, not much longer than the mesosoma and about 1.6 times as long as wide, dorsally with short, semidecumbent setae; large tergite taking up basal 0.7 of gaster, basal margin smooth and entire; ovipositor shortly exerted.

*Colour.* Body reddish brown except for tegulae which are brownish yellow; occipital pubescence golden yellow; pronotal collar yellowish; petiolar pubescence whitish; antenna entirely yellow; legs almost entirely yellow, femoral clubs slightly darkened.

*Length.* 1.5 mm.

*Male.* As for female but differing as follows: Head (figs 11 & 12); ocelli slightly larger; compound eye slightly larger with 45-50 facets; malar space about 1.1 times eye length. Antenna (fig. 13) 14-jointed with semidecumbent to erect pubescence on all joints except for the inner side of a3 and a4; scape as for female; pedicel 2.1 times as long as its greatest width; a3 expanded apically, about 4.1 times as long as its greatest width, with small but stout, subapical tooth on inner side; a4 expanded apically, 2.6 times as long as its greatest width, strongly emarginate on basal 0.75 of inner side, emargination with fine carina running along its length; a5-14 rounded; a5-6 each about as long as wide; a7 slightly transverse; a8-13 larger and more transverse; a14 ovoid, 1.4 times as long as wide and slightly narrower than a13.

*Mesosoma* (figs 14 & 15). As wide as head; scutellar disc as for female but slightly rugose apically. Fore tibia with apical spine about 0.3 times apical width of fore tibia; mid-leg highly modified; mid-

trochanter produced ventrally, broadly triangular with a dense fringe of hairs (fig. 16); mid-femur broadest near to middle; mid-tibia (figs 17 & 18) strongly twisted, and sub-apically constricted; apical spine of mid-tibia stout, curved, lamelliform, apically blunt, about as long as inner spur, but four times as wide; outer tibial spur strongly developed, 1.5 times as long as inner spur, apically curved, set almost perpendicular to tibia and inserted sub-apically; mid-basitarsus about 1.4 times as long as the tarsal end joint. Wings fully developed, extending well beyond apex of gaster, fragile, somewhat broken; wing veins weak; wing membrane of forewing evenly covered with setae, its marginal cilia long, the greatest width of the forewing 3.3 times the length of its longest cilium; hind wing narrow, its greatest width about 1.2 times the length of its longest cilium.

*Metasoma.* Similar to that of the female; petiole (fig. 14); gaster more dorso-ventrally flattened apically and with genitalia partly exserted.

*Colour.* As for female, also wing veins brownish yellow and wing membrane colourless.

*Length (of holotype).* 1.5 mm.

*Material.* HOLOTYPE, ♂ Japan, Honshu, Ibaraki Pref., Tsukuba, NIAES, Pan Trap, 4-14. VIII. 1989, M. J. Sharkey (CNCI). Paratype ♀, same data (DGN).

*Biology.* Host unknown. The similarity of *T. tortilis* sp. n. to *T. cincticollis* suggests a myrmecophile habit. The biological significance of the unusual modification of the mid-leg of male *T. tortilis* is uncertain. The structure of the tibia and basitarsus, with the apical spine opposing the emargination of the basitarsus is similar in some respects to that of the fore tibial antenna cleaner and it is possible that it is used during courtship for grasping or stimulating the female. Other diapiiids, such as *Trichopria sociabilis* Masner, have been seen to use the mid-leg during courtship.

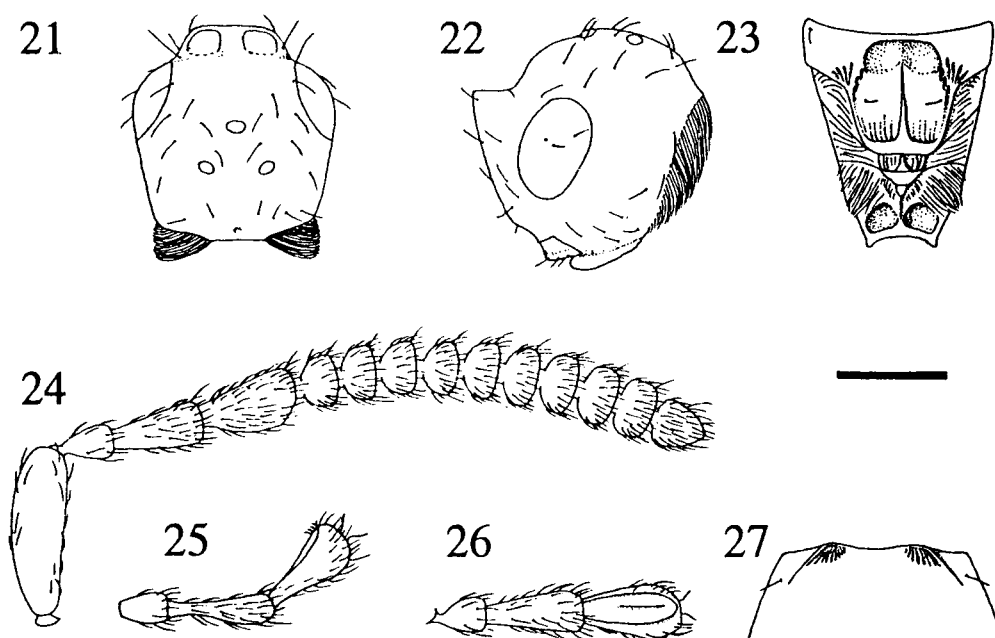
*Distribution.* Known only from the type locality in Honshu, Japan.

*Comments.* The male of this species is unusual among the Diapiiini in having a pronounced sexual modification on the third antennal joint (fig. 13), this character alone will separate it from other known *Tetramopria*. The following characters serve to associate the male and female: the presence of an apical mid-tibial spine; the angular head profile; the pronounced concavity ventrally in front of the mid coxae; the domed, striate scutellar disc, also both sexes were collected at the same locality on the same date. *T. tortilis* sp. n. appears to be most closely related to the European *T. cincticollis* Wasmann, because they both share the derived character states of an enlarged trochanter and a twisted tibia. The specific epithet comes from the Latin adjective *tortilis*, meaning twisted, a reference to the mid-tibia of the male.

### ***Tetramopria turbinata* sp. n. (figs 21-27)**

*Male.* Head with short, semidecumbent setae, longer than wide (1:0.85) seen from above (fig. 21), widest across eyes which are set far forward, evenly tapered behind eyes, rounded when seen from the side (fig. 22), frons strongly convex; occiput with a dense, regularly arranged cushion of setae on either side; ocelli arranged in a roughly equilateral triangle of which the base is slightly longer than the other sides; malar space about 0.6 times the width of the eye; mouth opening slightly more than half the head width; mandibles triangular, apically bidentate, only overlapping a little. Antenna (fig. 24) 14-jointed with short, semidecumbent to erect setae except on inside of a<sub>4</sub>; scape and pedicel appearing dull due to reticulate microsculpture; scape short, 0.9 times as long as width of head, robust, about 4 times as long as greatest width, somewhat tapered basally; pedicel conical, about 1.7 times as long as greatest width; a<sub>3</sub>-14 shiny and smoother than the pedicel, a<sub>3</sub> & a<sub>4</sub> (figs 25 & 26) elongate, obconical; a<sub>3</sub> 2.5 times as long as wide; a<sub>4</sub> more strongly expanded apically than a<sub>3</sub>, 2.1 times as long as wide with emargination on inner side extending from base almost to apex, inner face of emargination concave with a fine carina, also more strongly carinate





**Figs. 21-27.** *Tetramopria turbinata* sp. n. ♂: 21, head, dorsal view; 22, head, lateral view; 23, posterior mesosoma, dorsal view; 24, antenna, lateral view; 25, antenna, pedicel to fourth joint, dorsal view; 26, antenna, pedicel to fourth joint, showing face of emargination; 27, base of large tergite, dorsal view. Scale bar 0.2 mm.

at edges; a5-13 turbinate, transverse, becoming slightly shorter and more transverse apically; a14 ovoid, about 1.5 times as long as wide, hardly as wide as a13.

**Mesosoma.** Slightly wider than head, pronotum with a narrow, dense, regular collar of hairs, shoulder produced into a rounded boss not covered by collar; mesoscutum smooth, convex, with ten, short, semidecumbent setae arranged mostly in two submedial rows; scutellum (fig. 23) with a deep, reniform pit which becomes foveate in its hind corners where it joins the lateral scutellar grooves; lateral areas of scutellum costate adjacent to basal pit; scutellar disc tectiform, with a strong medial carina which extends halfway across the basal pit; posterior half of disc weakly striate; the lateral scutellar grooves continue across disc near apex marking off a broad posterior margin; mesopleuron smooth, with only a few short adpressed setae; metapleuron and side of propodeum barely covered in adpressed setae; dorsal areas of propodeum (fig. 23) well defined, anteriorly dull with adpressed setae, posteriorly with a deep fovea on each side and a broad margin, medially with a strongly developed keel which is produced anteriorly into a blunt tooth. Legs unremarkable, without sexual modification; mid-basitarsus about 1.1 times as long as the tarsal end joint; hind femur about 3.0 times as long as wide. Wings entire, fully developed, extending well beyond apex of gaster, wing veins weak, wing evenly covered with setae, except for small bare patch at apex of marginalis, marginal cilia of forewing short, greatest width of the forewing about 8 times the length of its longest cilium; hind wing broad, its greatest width about 2.5 times the length of its longest cilium.

**Metasoma.** Petiole robust, somewhat elongate and slightly raised dorsally when seen from side, rugose in front, covered in adpressed hairs behind, these hairs are longer apically and drawn out into four tufts; gaster collapsed in this specimen, but large tergite with almost no setae except for latero-basals, its basal margin undulating (fig. 27), with two short, oblique carinae each with a small

weakly concave and finely striate area on its inner side.

**Colour.** Body mostly blackish brown; occipital pubescence golden yellow; pronotal collar yellowish; tegula reddish brown; petiolar pubescence whitish; apex of gaster shading to reddish brown; antenna brown, except for pedicel and base of a3 which are yellowish brown; legs yellowish with femoral and tibial clubs brownish; wings with veins yellowish and membrane colourless.

**Female.** Unknown.

**Length** (of holotype). 2.0 mm.

**Material.** HOLOTYPE ♂, S. Korea, Mt. Sudo, 128°00'E, 35°50'N, 400m, 22. VIII.1990, K. Yamagishi (CNCI).

**Biology.** Host unknown. The similarity of *T. turbinata* sp. n. to *T. aurocincta* suggests a myrmecophile habit.

**Distribution.** Known only from the type locality at Mount Sudo, South Korea.

**Comments.** *T. turbinata* sp. n. appears to be most closely related to *T. aurocincta* with which it shares the derived character state of basal foveae on the large tergite. The specific epithet comes from the Latin adjective *turbinatus*, meaning top-shaped, a reference to the flagellar joints of the male.

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## LITERATURE CITED

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**東아시아産 *Lepidopria*屬 및 *Tetramopria*屬(벌목, Proctotrupoidea, Diapriidae, Diapriini)의 3新種 記載**

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금번연구를 통해 *Lepidopria*屬 및 *Tetramopria*屬의 3新種 [*Lepidopria masneri* sp. n., *Tetramopria tortilis* sp. n. 및 *Tetramopria turbinata* sp. n.]이 기재된다.

검색어 : 벌목, Proctotrupoidea, Diapriidae, Diapriini, *Lepidopria*屬, *Tetramopria*屬

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